



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/645,805	08/21/2003	Dharam Pal Gosain	09792909-5657	8039
26263	7590	11/14/2005		
SONNENSCHN NATH & ROSENTHAL LLP P.O. BOX 061080 WACKER DRIVE STATION, SEARS TOWER CHICAGO, IL 60606-1080			EXAMINER SCHILLINGER, LAURA M	
			ART UNIT 2813	PAPER NUMBER

DATE MAILED: 11/14/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/645,805

Applicant(s)

GOSAIN ET AL.

Examiner

Laura M. Schilling

Art Unit

2813

hm

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 September 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-37 is/are pending in the application.
- 4a) Of the above claim(s) 10-23 and 29-37 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☐ Claim(s) 1-9 and 24-28 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 8/22/05.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-6, 9, 24-28 are rejected under 35 U.S.C. 102(e) as being anticipated by Hatano et al ('614).

The following limitations are anticipated by Hatano as cited below:

1. A method of producing a crystalline semiconductor material composed of a plurality of single-crystal grains of a semiconductor comprising:
a first step of forming an amorphous material of said semiconductor or a polycrystalline material of said semiconductor on substrate (Col.8, lines: 20-30); and
a second step of forming a uniformly heat-treating polycrystalline material a temperature as to partially melt crystal grains having a specific face orientation with respect to the vertical direction of the surface of said substrate and melt said amorphous material or crystal grains having face crystalline material by said amorphous material or said by a plurality of times at such orientation other than said specific face orientation (Col.9, lines: 1-10 and 15-27).

2. A method of producing a crystalline semiconductor material according to claim wherein said semiconductor is at least one kind selected from a group consisting of silicon (Si) (Col.9, lines: 1-10).

3. A method of producing a crystalline semiconductor material according to claim 2, further comprising the step of forming a silicon oxide film between said substrate and said amorphous material or said polycrystalline material (Col.8, lines: 5-10).

4. A method of producing a crystalline semiconductor material according to claim face orientation is a (100) orientation (Col.9, lines: 15-27).

5. A method of producing a crystalline semiconductor material according to claim wherein said heat-treatment in said second step is performed by irradiating said amorphous material or said polycrystalline material with a pulse laser beam (Col.8, lines: 25-35)

6. A method of producing a crystalline semiconductor material according to claim 5, wherein said pulse laser beam is an excimer laser beam (Col.10, lines: 50-55).

9. A method of producing a crystalline semiconductor material according to claim wherein said substrate made from a glass material or plastic material (Col.8, lines: 5-10).

Art Unit: 2813

24. A method of fabricating a semiconductor device crystalline semiconductor material composed of plurality of single-crystal grains semiconductor, comprising:
a first step of forming an amorphous material of said semiconductor or a polycrystalline material of said semiconductor on a substrate(Col.8, lines: 20-30); and
a second step of forming a crystalline material by uniformly heat-treating said amorphous material or said polycrystalline material by a plurality times at such a temperature as to partially melt crystal grains having a specific face orientation with respect to the vertical direction of the surface of said substrate and melt said amorphous material or crystal grains having a face orientation other than said specific face orientation(Col.9, lines: 1-10 and 15-27)..

25. A method of producing a semiconductor device according to claim 24, wherein said semiconductor is at least one kind selected from a group consisting of silicon (Si), germanium (Ge), and carbon (Col.9, lines: 1-10).

26. A method of fabricating a semiconductor device according to claim 25, further comprising the step of forming a silicon oxide film between said substrate and said amorphous material or said polycrystalline material(Col.8, lines: 5-10).

27. A method of fabricating a semiconductor device according to claim 26, wherein said face orientation is a (100) orientation (Col.9, lines: 15-27)..

Art Unit: 2813

28. A method fabricating semiconductor device according to claim 24, wherein said heat-treatment in said second step is performed by irradiating said amorphous material or said polycrystalline material with a pulse excimer laser beam(Col.10, lines: 50-55).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hatano et al ('614).

In reference to claims 7 and 8, Hatano teaches method of producing a crystalline semiconductor material according to claim 5, wherein said pulse producing a crystalline semiconductor material according to claim pulse width of said pulse laser beam is set between 100-1 ns (Col.7, lines: 15-20), not 150 ns as claimed by the Applicant. Moreover, Hatano teaches a method of producing crystalline semiconductor material according to claim 7, wherein the number of pulse laser irradiation is multiple times, however fails to teach in a range of 10 to 400 times. However, these claims are prima facie obvious without showing that the claimed ranges achieve unexpected results relative to the prior art range. In re Woodruff, 16 USPQ2d 1935, 1937 (Fed. Cir. 1990). See also In re Huang, 40 USPQ2d 1685, 1688(Fed. Cir. 1996)(claimed ranges of a result effective variable, which do not overlap the prior art ranges, are unpatentable unless they produce a new and unexpected result which is different in kind and not merely in degree from

Art Unit: 2813

the results of the prior art). See also *In re Boesch*, 205 USPQ 215 (CCPA) (discovery of optimum value of result effective variable in known process is ordinarily within skill of art) and *In re Aller*, 105 USPQ 233 (CCPA 1955) (selection of optimum ranges within prior art general conditions is obvious).

Response to Arguments

Applicant's arguments filed 9/2/05 have been fully considered but they are not persuasive. Applicant argues that the laser annealing is not uniform, however this is not persuasive see Col.6, lines: 20-25) which describes the laser beam pattern as “uniform”.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

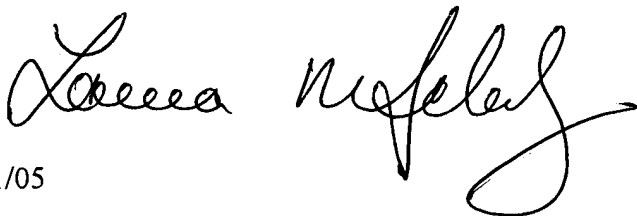
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Art Unit: 2813

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Laura M. Schillinger whose telephone number is (571) 272-1697. The examiner can normally be reached on M-T, R-F 7:00-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl W. Whitehead, Jr. can be reached on (571) 272-1702. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to read 'Laura M. Schillinger', with a long, sweeping horizontal stroke extending to the right.

Laura M Schillinger
Primary Examiner
Art Unit 2813

11/11/05